Incumbent Regulation and Adverse Selection: You Can Keep Your Health Plan, But at What Cost?*

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September 14, 2021

Abstract

The 2010 Affordable Care Act (ACA) instituted incumbent regulation policies in the small group market, where existing health plans could choose to defer compliance with ACA regulations. This created incentives for employers with lower expected healthcare costs and greater uncertainty to not immediately become ACA compliant. We use unique national data with over 300,000 employer-years from 2013-2017. Consistent with these incentives, we find that employers with healthier enrollees and those with more turnover were more likely to not immediately comply. This created adverse selection in the ACA-compliant market, increasing its annual healthcare costs by $365 per individual in 2014.

JEL Codes: I11, I18, H51, L51

Keywords: Small Group Market, Health Insurance, Community Rating

*We thank seminar participants for helpful comments and acknowledge funding from the Agency for Healthcare Policy and Research (Grant 1R01HS024850-01). The insurance company which we consider in this study provided us with the study data but has not provided us with financial support or edited or influenced the direction or conclusions of our research. Contact authors at sebastian.fleitas@kuleuven.be, gautamg2@gmail.com, and alosasso@depaul.edu

1 Introduction

Incumbent regulation—where agents are subject to the existing rules until they opt into the new framework—has a long history in settings ranging from environmental emissions (Ryan, 2012) to fishing licenses (Anderson, Arnason and Libecap, 2011) and land use (Damon et al., 2019). Incumbent regulation has both upsides and downsides (Damon et al., 2019). On the one hand, it creates a notion of fairness for economic actors making decisions with sunk costs, by ensuring that regulations will not change in such ways that substantially devalue those decisions. On the other hand, it may foster rent-seeking by incumbents, impeding the ability of new actors to compete and making it difficult to achieve the intended goals of new policies.

Incumbent regulation has been particularly important in U.S. health insurance reform. Because health insurance enrollees may face substantial switching costs (Handel, 2013), policymakers have been reluctant to enact laws that dramatically alter insurance coverage. This is particularly true for the 2010 Affordable Care Act (ACA), the most comprehensive healthcare reform legislation in a generation. The goals of the ACA were to guarantee health coverage for all Americans while minimizing the market failure from adverse selection. Key aspects of the law included guaranteed issue of insurance, a relatively generous set of minimum benefits, a prohibition on experience rating policies based directly on enrollee health status, and a penalty for not obtaining health insurance coverage (which was later eliminated).

Many observers worried that the ACA would unnecessarily disrupt the private insurance market. In advocating for the law, President Obama defended this issue by noting that any such changes would be mitigated by incumbent regulation, famously stating, "If you like your health care plan, you can keep it." While later derided by some parties as inaccurate, the ACA allowed for incumbent regulation of health plans sold prior to its signing date of March 23, 2010, which was extended by an executive order to health plans purchased before the implementation of key ACA provisions on January 1, 2014. Importantly, plans not compliant with ACA regulations—which we call legacy plans—have been authorized to continue operating, most recently through the end of 2021. In 2018, 21% of employers with fewer than 50 employees were still offering legacy plans to their employees.[1]

[1] 2018 Kaiser Family Foundation Employer Health Benefit Survey.

The purpose of this study is to evaluate the impact of ACA incumbent regulation on adverse selection, using unique national data from an insurer. The underlying data contain information on over 300,000 employer-years from 2013-17. We consider whether employers with health risk profiles that would benefit from ACA-compliant plans disproportionately selected into these plans, and the extent to which this increased costs and premiums for these plans. Though the ACA restrictions on experience rating applied to individual and some group plans, our work focuses on the small group market—which consists of plans sold to groups with 50 or fewer employees. Experience rating regulations are important for this market since these plans were typically at least partially experience-rated prior to the ACA and the small size of each group can imply significant variation in mean group health risk. Moreover, simulation evidence forecasted that incumbent regulation would cause substantial adverse selection for ACA-compliant plans in the small group market (Eibner et al., 2012).

The biggest difference between legacy plans and ACA-compliant plans is that legacy plans are allowed to experience rate while ACA-compliant plans must "community rate," not charge differential premiums based on health status or claims history within a geographic region, except for allowed differences based on age and smoking status. This creates incentives for employers with healthier enrollees to remain in legacy status. A second important difference is that plans cannot return to legacy status once they are ACA compliant. This creates option value for plans to remain legacy status. Employers with more uncertainty about their future average healthcare risk will benefit more from this option value and hence be less likely to adopt ACA compliance.

We examine whether employers act in ways that are consistent with these incentives. In particular, we consider whether employers with healthier enrollees are more likely to remain in legacy status, all else equal. We also consider whether employers with more turnover in 2013 (and hence more option value) are more likely to remain in legacy status, all else equal. Finally, we quantify the impact of this selection on costs and premiums in the ACA-compliant market.

We find evidence of adverse selection: a doubling of expected healthcare costs for an employer at the population mean is associated with it being 3 percentage points less likely to maintain legacy status each year. We also find that employers with more turnover in the pre-ACA period were less likely to adopt ACA-compliant plans, providing evidence in favor of the option value story. A one standard deviation increase in 2013 plan turnover decreases the probability of adopting ACA

compliance by 2.4 percentage points. This selection created a significant adverse impact on the community-rated risk pool cost, of about $365 in costs and $78 in premiums, annually per member in 2014, though this effect diminished over time.

Our work contributes to the substantial literature on adverse selection in health insurance markets, by considering the role of incumbent regulation. In studies of a single large employer, Cutler and Reber (1998); Finkelstein (2004); Einav, Finkelstein and Cullen (2010); Einav and Finkelstein (2011); Geruso et al. (2019) consider the effects of a fixed menu of contracts on adverse selection and other outcomes. Handel (2013); Shepard (2016); Lavetti and Simon (2018); Geruso, Layton and Prinz (2019) examine the impact on adverse selection of inertia, narrow networks, drug formularies, and ACA plan design, respectively. Finally, Lo Sasso and Lurie (2009); Ericson and Starc (2015); Handel, Hendel and Whinston (2015); Geruso (2017) study the implications of price regulation policies on adverse selection.

Our work also adds to the study of the employer-sponsored health insurance market through our focus on the small group market. Cebul et al. (2011) and Dafny, Ho and Varela (2013) study choice frictions and limited choice in employer-sponsored insurance. Buchmueller and DiNardo (2002) investigate whether the implementation of community rating in New York led to adverse selection. Bundorf, Levin and Mahoney (2012) examine the welfare loss from employee self-selection into plans among those offered by their employer. Fleitas, Gowrisankaran and Lo Sasso (2018) estimate the extent of reclassification risk in the experience-rated small group market. Fleitas et al. (2021) and Dickstein, Ho and Mark (2021) study the welfare effects of market segmentation, analyzing the small group market and the ACA exchanges.

The remainder of the paper is structured as follows. Section 2 develops our analytic framework and empirical approach. Section 3 describes our data. Section 4 presents results. Section 5 concludes.

2 Analytic and Empirical Framework

2.1 Theoretical Background

We develop a simple model of incumbent regulation that provides intuition for our empirical approach. We consider the employer's timing decision of when to adopt ACA-compliant status

(with community-rated premiums). The employer starts in period $t = 0$ with a legacy plan (with experience rated premiums). At any period t where it offers a legacy plan to its employees, it can keep this status or switch to ACA compliance. It makes this decision to minimize its discounted costs of providing insurance.

The decision has dynamic implications because once the plan has adopted ACA compliance, it cannot return. Thus, ACA compliance is a terminal state, while legacy status incorporates the option of adopting in the future.

Let V_t^L and V_t^{ACA} denote the employer's values from choosing legacy and ACA-compliant plan statuses at time t, respectively, and let β denote the employer's discount factor. The overall time t value is $V_t = \max\{V_t^L, V_t^{ACA}\}$. The value from each choice consists of the negative of period costs from the choice plus the expected future value. We assume that period costs depend on plan premiums, with the employer paying a share ϕ of premiums. Plan premiums $p(\cdot)$ are a function of the average health risk of the relevant risk pool.[2]

Importantly, the risk pool, and hence potentially premiums, vary across plan status. For a legacy plan, the risk pool is the average risk for all enrollees at the plan. For ACA-compliant plans, the risk pool is the average risk for all enrollees in the *market* of ACA compliant plans. The ACA compliant market includes multiple employers and hence has more people in its risk pool. Let N_E denote the number of people at the plan and N_M the number of people in the market. Note that $N_M > N_E$. Denote $Plan\ Risk_t = \frac{1}{N_E}\sum_1^{N_E} r_{it}$ and $Market\ Risk_t = \frac{1}{N_M}\sum_1^{N_M} r_{it}$, where r_{it} is the health risk of each individual i in the market at time t, the first N_E of whom work for the employer in question. The health risk r_{it} measures expected healthcare costs, normalized so that the mean expected cost in the population is 1. We can then write the value functions as:

$$\begin{aligned} V_t^L &= -\phi \times p(Plan\ Risk_t) + \beta E\left[\max\{V_{t+1}^L, V_{t+1}^{ACA}\}\right], \\ V_t^{ACA} &= -\phi \times p(Market\ Risk_t) + \beta E V_{t+1}^{ACA}, \end{aligned} \tag{1}$$

where the expectation is over future health risk.

The employer's period t decision rule specifies that a legacy plan will remain in legacy status if and only if $V_t^L \geq V_t^{ACA}$. The value of remaining in legacy status incorporates the option

[2]For simplicity, our theoretical model uses the same $p(\cdot)$ function across both plan types, but our empirical work estimates different functions by plan type.

value of switching to ACA compliance in a future period, while the value of switching to ACA-compliant status does not incorporate any option value. This option value of remaining in legacy status implies that the employer decides to keep its plan in legacy status whenever $Plan\ Risk_t < Market\ Risk_t$ and may sometimes maintain legacy status even when $Plan\ Risk_t \geq Market\ Risk_t$, if the difference is not too large.

Testable implications. We draw two main testable implications from the theoretical model. First, legacy plans will have an average plan risk that is lower than the risk of switchers to ACA compliance or the ACA market as a whole. This is because high risk plans tend to switch to ACA compliance. Thus, incumbent regulation creates adverse selection for ACA-compliant plans and thereby increases their premiums.

Second, employers with a greater variance of future healthcare risk scores are more likely to remain in legacy status, all else equal. This is because the $E\left[\max\{V_{t+1}^{L}, V_{t+1}^{ACA}\}\right]$ term in (1), which indicates the option value from remaining in legacy status, will be higher as variance increases.

2.2 Estimation and Identification

The goal of our empirical work is to understand whether and how much incumbent regulation led to adverse selection in the market for ACA-compliant small group plans. We first perform initial analyses that characterize the impact of risk scores on health expenditures and premiums. Our main analyses then consider the two testable implications above. Finally, we quantify the impact of adverse selection on ACA-compliant plan costs and premiums.

Initial Analyses. To quantify the impact of incumbent regulation on plan costs, we estimate a parameter that scales health risk—which is normalized to have a population mean of 1—into annualized dollar costs. Following Fleitas, Gowrisankaran and Lo Sasso (2018), we estimate:

$$c_{ijt}^{ins} = \delta r_{ijt} + \delta_2 x_{it} + \varepsilon_{ijt}, \tag{2}$$

where δ is the parameter of interest and c_{ijt}^{ins} measures the total dollar value of claims for individual i in plan j over the year t. Equation (2) considers the impact of the individual's current risk score—estimated using the previous year's claims—on current claims to the insurer. Our unit of observation here is the employee/year. Our base sample includes all individuals in the sample in

both 2014 (to obtain their 2014 healthcare costs) and 2013 (to obtain their 2013 risk score).

The empirical specification incorporates controls x_{it}, which include plan cost-sharing characteristics and market—which we define as state—fixed effects to control for variation in provider prices. Unless individuals with different plans systematically use different cost providers for the same conditions in a way that correlates with the risk at that plan, we do not need to include plan or enrollee fixed effects.

To quantify the impact of incumbent regulation on plan premiums, we also estimate the effect of the risk pool on premiums, with separate hedonic regressions for legacy and ACA-compliant plans, using:

$$Premium_{jmt} = \tau_1 Market\ Risk_{mt} + \tau_2 Plan\ Risk_{jmt} + \tau_3 X_{jmt} + \tilde{\tau}_m + \bar{\tau}_t + \varepsilon_{jmt}, \tag{3}$$

where $Premium_{jmt}$ is the annual per-member premium of plan j in market m in period t, $Market\ Risk_{mt}$ is the risk for ACA compliant plans in the market, $Plan\ Risk_{jmt}$ is the plan risk, X_{jmt} indicates plan cost-sharing and enrollee characteristics, $\tilde{\tau}_m$ are state fixed effects, and $\bar{\tau}_t$ are year fixed effects. The τs are parameters to be estimated with τ_1 being the main parameter of interest.

In (3), τ_1 captures the effect of market risk on plan premium. Since we include plan cost-sharing characteristics and state (equivalently, market) fixed effects, the identifying variation for this parameter comes from variation in community-rated risk over time within the same market, controlling for plan cost-sharing characteristics.

Our unit of observation in (3) is a plan/year. About 80% of employers in our small group market sample offer only one plan. For the remaining 20% of employers, a potential issue is that employees may switch between plans if one plan transitions to ACA-compliant status but others do not. As a robustness check, we also also estimate our main analyses using only the sample of employers that offer one plan.

Main analyses. Following Section 2.1, we first test the prediction that employers with higher mean plan risk will have a higher probability of adopting ACA compliance, all else equal, by

estimating the hazard for adoption of ACA compliance:

$$ACA\ Compliant_{jmt} = \alpha_0 + \alpha_1\ Plan\ Risk_{jmt} + \alpha_2 X_{jmt-1}\ + \alpha_3 W_{mt}\ +\ \nu_{jmt}, \tag{4}$$

where the αs are the parameters to be estimated, $ACA\ Compliant_{jmt}$ is an indicator for adoption of ACA compliance, $Plan\ Risk_{jmt}$ is the average plan health risk (calculated using lagged data), X_{jmt-1} are a set of plan cost-sharing characteristics and enrollee characteristics, and W_{mt} are state-by-year fixed effects. The main parameter of interest is α_1, which captures the effect of the plan risk on the probability of adopting ACA compliance. We use lagged regressors since the adoption decision is made before the beginning of the year and hence before the time t regressors are observed.

Second, in order to test the prediction that employers with a higher option value will have a lower probability of adopting ACA compliance, we estimate specifications similar to (4) but with the addition of a proxy for the variance of future health risk. We use employee turnover in 2013 (prior to the start of ACA-compliant plans) as our predictor of variance of future risk scores, since new employees will have different health conditions from existing employees.

For all specifications for our main analyses, because we model adoption of ACA compliance status, our unit of observation is a plan/year, for each plan/year where the plan ended the previous year with legacy status. Thus, we drop plans from the sample from the year after they are ACA compliant. In this way, we estimate a duration model with a time varying "hazard" of ACA compliance adoption, similar to Chernew, Gowrisankaran and Fendrick (2002).

Our main identification assumption is that plan risk is conditionally mean independent from unobserved factors that affect the adoption of ACA compliance. A potential threat to identification is that employers with high plan risk were disproportionately in legacy plans with high cost-sharing (e.g., high copays and deductibles). Since ACA-compliant plans include a relatively generous standard benefits package, these plans may switch to compliance to obtain better benefits instead of directly because of selection. If we do not control for cost-sharing characteristics, then this would create a correlation between the unobserved factors that affect adoption and plan risk.

In order to examine this threat to identification, we present specifications that control for plan

cost-sharing characteristics and interactions of market and time, together with specifications that do not control for these characteristics. These controls for characteristics mitigate the above threat to identification. In addition, a comparison of the impact of plan risk on switching to ACA-compliance across specifications with different observable controls allows us to understand the potential for selection based on unobservables, in the spirit of Altonji, Elder and Taber (2005).

3 Data and Summary Statistics

3.1 Data

Our data come from a large, national health insurance company that we refer to as "United States Insurance Company" (USIC). They include small group (50 or fewer employees) health insurance policies sold from 2013-2017 in most of the 50 states.

The years of our data straddle the 2014 implementation of ACA-compliant plans for the small group market. Our main sample includes plans observed in 2013, which were eligible for incumbent regulation since they predated this implementation.

ACA-compliant plans must include an "essential benefits package" of covered services. They also were mandated to offer coverage to any willing employer (guaranteed issue) and to community rate: premiums could only vary 1:3 based on the age distribution of enrollees and 1:1.5 based on the smoking status of enrollees. Health status of enrollees could otherwise not influence premiums for ACA-compliant plans within a market. While legacy plans were exempt from these aspects of the law, starting in 2010, all small group plans (including legacy plans) were prohibited from (1) placing lifetime limits on the dollar value of coverage, (2) excluding coverage of pre-existing condition for children, and (3) placing annual or lifetime limits on the dollar value of coverage, and were required to extend dependent coverage to adult children up to age 26.

Our data contain information at both the plan-month and enrollee-month (employee or dependent) levels. At the plan-month level, for all the employers that contract with USIC, we observe the number of health insurance plans available to their enrollees, the cost-sharing characteristics of each plan, and the total premium paid by the employer to the insurer for each plan in each month. We calculate a per-enrollee annual premium by dividing the total premium paid by the employer to USIC over the year by 12 and by the number of enrollee-months (employees and dependents)

taking up insurance at that employer during that year.

ACA-compliant plans are priced at a market level.[3] The ACA left the definition of markets for pricing areas up to individual states.[4] States might choose smaller areas than a state as the market. Our pricing regressions define the employer's state as its market, since we do not have precise information on the employer's location(s) within a state.

At the enrollee-month level, we observe age, gender, the health plan chosen, the relationship of the enrollee to the employee (e.g., self, spouse, child), information to link the enrollee to the employer and to the employee with employer-sponsored coverage, and whether the enrollee is covered in that month. We also observe medical and pharmaceutical claims for every healthcare encounter. These data provide diagnosis, procedure, date of service, and paid amounts, and are linked to the enrollee identifier.

To measure the predicted health expenditure risk for each enrollee (r_i), we use the ACG risk prediction software developed at Johns Hopkins Medical School. The software produces an "ACG score" for each enrollee in each year. The ACG score indicates the predicted relative healthcare cost for the individual over the year, and has a mean of 1 in a population reference group chosen by ACG. The ACG score is based on past diagnostic codes, expense, prescription drug consumption (code and length of consumption), age, and gender for each individual. In our case, we use the twelve months of data from the previous year to generate the ACG score for each enrollee for a given year. We then average the scores across enrollees to create plan and market level mean scores.

The insurer provided a single indicator for ACA compliance at the plan level, that indicates whether the plan was ACA compliant in 2017. Importantly, since the indicator is measured only in 2017, we do not know precisely when a plan switched from experience rating to ACA compliance. However, given that regulations stipulate that plans lose their legacy status when they change their benefit structure, we impute the year when a plan adopted community rating status from the presence of characteristic changes. Since this measure may be imperfect, we verified our results with three alternative measure. First, as one extreme, we assume that all plans marked as ACA compliant in 2017 adopted compliance in 2014 when the ACA regulations were implemented.

[3] CMS details the pricing rules for ACA-compliant plans.
[4] CMS also details the pricing areas for ACA-compliant plans.

Second, as the other extreme, we assume that all compliant plans adopted in 2017, deriving the enrollee characteristics for (4) from 2016 data. Third, we again assume that all compliant plans adopted in 2017, but derive enrollee characteristics for (4) from 2013 data.

Finally, our data allow us to calculate plan turnover. Since the ACA small group market started in 2014, we define turnover based on 2013 data. Specifically, we define turnover for each plan as the number of enrollees with fewer than 12 months of coverage divided by the total number of enrollees at the plan, in 2013.

3.2 Summary Statistics

Table 1: Descriptive Statistics

	(I)	(II)	(III)	(IV)
	Remain in Legacy Status in Year t		Adopt ACA Compliant Status in Year t	
	Mean	Std. Dev.	Mean	Std. Dev.
Plan cost-sharing characteristics and premiums:				
In Hospital Coinsurance	0.89	0.13	0.87	0.12
In Hospital Individual Deductible	$2,342	$1,683	$1,843	$1,338
In Hospital Family Deductible	$5,347	$3,616	$4,404	$3,257
Emergency Copayment	$188.4	$97.3	$188.4	$108
In Office Coinsurance	0.99	0.05	0.98	0.06
Physician Copayment	$23.5	$10.9	$23.7	$11.3
Individual Out-of-Pocket Maximum	$4,022	$2,569	$4,034	$1,920
Family Out-of-Pocket Maximum	$8,337	$4,870	$8,586	$4,020
No Out-of-Network Coverage	0.12	0.32	0.08	0.27
Premiums	$5,668	$2,086	$6,095	$2,051
Enrollee characteristics:				
Mean Subscriber Age	37	9	37	9
Fraction Female	0.44	0.22	0.49	0.22
Fraction Employees	0.65	0.24	0.65	0.24
Number of Employees	8.2	7.5	6.7	6.2
Number of Subscribers	14.8	16.1	11.8	12.4
Plan Risk	1.14	0.86	1.31	1.09
Plan Turnover in 2013	0.43	0.37	0.37	0.36
Total Observations	89,122		26,264	
	Fraction of Observations		*Fraction of Observations*	
2014	0.58		0.42	
2015	0.86		0.14	
2016	0.97		0.03	
2017	0.88		0.12	

Note: Table presents characteristics of our main estimation sample for the estimation of Equation 4. Each observation is a plan/year for which the plan was in legacy status through the previous year and was observed continuously from 2013-17. We compute health risk r using medical claims from the previous year. Plan risk is the mean health risk over all individuals in the plan for which health risk (r) is available.

Table 1 presents descriptive statistics on our main estimation sample. Each observation is a plan/year for which the plan was in legacy status through the previous year. All of the plans

in this sample were observed in the pre-ACA period and thus had the ability to maintain legacy status if they chose to. We separate these statistics into two groups. Column I and II present the plan/year observations for which the plan remains in legacy status in year t. Columns III and IV present the plan/year observations for which the plan adopted ACA compliance in year t.

We present statistics on a number of plan cost-sharing characteristics, including in-hospital coinsurance, in-hospital individual deductible, and in-hospital family deductible. While the characteristics are generally very similar for plans that remain in legacy status and those that adopt ACA compliance, one difference is that adopters have lower individual and family deductibles. Premium levels are also different across these two groups: annual premium per capita are $5,668 for legacy-status plans and $6,095 for ACA-compliant plans.

The average plan has a mean subscriber age of 37, which does not vary with status. The ACA-compliant plans show a higher fraction of females (49 percent vs. 44 percent for legacy status plans) but a similar fraction of employees (65 percent). ACA-compliant plans have a smaller number of enrollees (6.7 employees and 11.8 subscribers vs. 8.2 and 14.8 respectively for legacy status plans). Our model in Section 2.1 predicts that plan risk will be higher for ACA-compliant plans than for legacy status plans. Table 1 verifies that this prediction is accurate in the raw data: mean plan risk is 1.14 for legacy status plans and 1.31 for ACA-compliant status. Plan turnover in 2013 is lower for ACA compliant plans (with a 2013 average of 37 percent of employees being covered for fewer than 12 months) than for legacy status plans (43 percent).

Finally, Table 1 shows the distribution of legacy plans and ACA-compliant plans by year. In 2014, 58% of plans that were eligible to keep legacy status remained in this status and the other 42% switched to ACA-compliant status. The fraction of eligible plans remaining under legacy status was 0.86, 0.97 and 0.88 for years 2015, 2016 and 2017, respectively. Overall, the weighted average annual probability of switching to ACA-compliant status was 23%.

4 Results

We present findings from the empirical specifications developed in Section 2.2.

4.1 Initial Analyses

Table 2 Panel A describes the relationship between healthcare spending and the individual risk score r_i. Column I reports that a one-unit change in individual risk represents \$3,120 in insurer expenditures, using 2014 expenditure data. Column II adds state fixed effects and column III includes all individual/year observations in our sample with risk scores. They show very similar results to Column I, of \$3,123 and \$3,263 respectively.

Table 2: Effect of Risk on Cost and Premiums

	(I)	(II)	(III)
Panel A: Expenditure and Risk			
Dependent Variable: Expenditure Paid by the Insurer			
Individual Health Risk, r_i	3,120*** (79)	3,123*** (79)	3,263*** (95)
Plan Cost-Sharing Characteristics	Y	Y	Y
State Fixed Effects	N	Y	Y
Year Fixed Effects	N	N	Y
Sample	2014	2014	2014-17
Observations	866,530	866,530	4,253,362
Panel B: Plans with ACA Compliance Status			
Dependent Variable: Annual Premiums per Individual			
Market Risk	664***(30)	546***(29)	691***(58)
Plan Risk		134*** (4)	119*** (4)
Average Age	153*** (0.31)	161*** (1.21)	164*** (1.14)
Number of Enrollees	-3*** (0.18)	-5*** (0.19)	-3*** (0.16)
Plan Cost-Sharing Characteristics	Y	Y	Y
Enrollee Characteristics	N	Y	Y
State Fixed Effects	N	N	Y
Year Fixed Effects	Y	Y	Y
Observations	209,013	209,013	209,013
Panel C: Plans with Legacy Status			
Dependent Variable: Annual Premiums per Individual			
Market Risk	2,664*** (53)	2,703*** (52)	26 (122)
Plan Risk	238*** (10)	241*** (11)	217*** (10)
Average Age	130*** (0.62)	112*** (2.08)	114*** (2.02)
Number of Enrollees	-9*** (0.21)	-9*** (0.21)	-7*** (0.20)
Plan Cost-Sharing Characteristics	Y	Y	Y
Enrollee Characteristics	N	Y	Y
State Fixed Effects	N	N	Y
Year Fixed Effects	Y	Y	Y
Observations	133,981	133,981	133,981

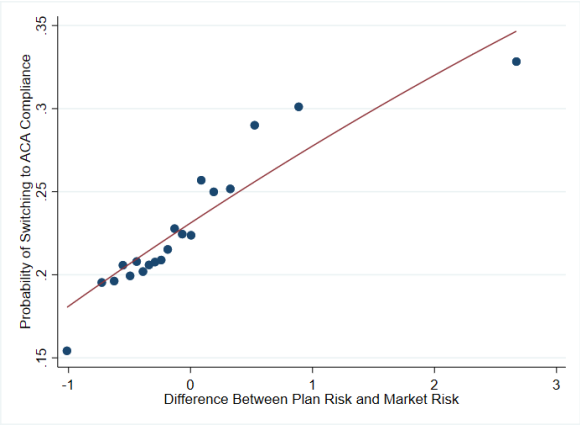
Note: Sample for Panel A, Columns I and II is all individuals (employees and dependents) who take up USIC small group insurance in 2014 and who were insured by the same employer with the same plan in 2013 (to compute a risk score). Sample for Panel A, Column III is all individual/years (employees and dependents) who take up USIC small group insurance in 2014-17 and who were insured by the same employer with the same plan in the previous year (to compute a risk score). Sample for Panel B is all ACA-compliant plans observed over 2013-2017 for two consecutive years (in order to compute a plan risk score). Sample for Panel C is all legacy plans observed over 2013-2017 for two consecutive years (to compute a risk score). Plan cost-sharing characteristics are listed in Table 1. Enrollee characteristics include fraction of male and female for ages less than 18, 18 to 30, 31 to 45 and 46 to 64, average age, and the number of enrollees. Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1

Table 2 Panel B presents hedonic regression results of the annual total premium per member, as a function of market risk and plan risk for all USIC ACA-compliant plans in our sample. We control for the average age of individuals in the plan, the number of enrollees, and plan cost-sharing characteristics. From Column I, a one-unit increase in the market risk score would increase premiums for each enrollee by $664 per year. From Column II, adding plan risk and a set of controls for the gender-by-age demographic breakdown of both employees and enrollees does little to change to the effect with a point estimate of $546 change in premiums per member per year. From Column III, further adding state fixed effects increases these estimate to $691 per member per year.

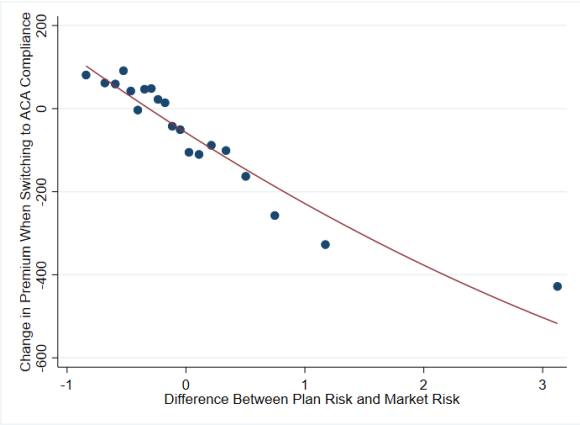
Panel C presents the analogous regression results for legacy plans.[5] We find that plan risk is an important predictor of premiums. The different columns include different controls. Column III, the specification with the most controls including state fixed effects, shows a small and insignificant coefficient on market risk. Together, these results suggest that USIC's premiums appear to be higher in markets with high risk, but that USIC does not adjust premiums following within-market changes in risk.

In both Columns II and III of Panel B, plan risk has a positive and statistically significant effect on premiums. The coefficients are about half the size of the analogous ones for non-community rated plans, as presented in Panel C. They nevertheless demonstrate that even in community rated markets, health risk affects premiums. There are a number of potential mechanisms for why an employer's own health risk might affect premiums. Employers with certain health risks (or lack thereof) may be drawn to particular types of plans. For example, Lo Sasso and Lurie (2009) found that community rating in the non-group market in the 1990s was associated with greater use of managed care, suggesting that even in the presence of community rating, insurers retain some ability to risk-segment the health insurance market using plan characteristics. More recently, Shepard (2016) found a similar relationship wherein insurers use prestigious provider networks to risk-segment the Massachusetts market.

Figure 1: ACA Compliance and Premiums Against Risk



(a) ACA Compliance Versus Plan Risk − Market Risk



(b) Δ Premiums Versus Plan Risk − Market Risk

Note: Each subfigure groups the x variable—which is the difference between plan risk and market risk—into 20 bins and then plots this variable against the expectation of the variable listed on the y-axis conditional on each bin, along with a quadratic fit line. Figure 1a uses the Table 1 sample. Figure 1b uses the subset of this sample for plan/years with a switch from legacy status to ACA compliance during the year.

4.2 Main Analyses

Our first analysis examines the impact of plan risk on switching to ACA compliance. Figure 1 displays plan risk, premiums, and switching behavior in the raw binned data, providing graphical evidence on this impact. Figure 1a shows that plans with higher plan risk relative to market risk are more likely to switch to ACA-compliant status. This indicates the presence of adverse selection into ACA compliance, a point we verify with regression analysis below. Figure 1b shows that plans with higher plan risk relative to market risk had higher average changes in premiums from switching. This highlights that the riskier the plan relative to market risk, the greater the premium savings from switching to ACA compliance, providing supporting evidence that the price mechanism is driving the adverse selection.

Table 3 shows the results of a linear probability model of plan adoption of ACA compliance on health plan risk. Columns I-IV consider whether plans with greater health risk are more likely to adopt ACA compliance. From Column I, a unit change in plan risk at the employer (equivalent to doubling health risk at the population mean) is associated with a 2.93 percentage point increase in the likelihood of the plan adopting ACA compliance in any year in which it has legacy status.

[5]The Panel C sample includes more observations does Table 1 because the Panel C sample does not require plans to be continuously observed for inclusion.

Since the weighted mean probability of a plan switching from legacy to ACA-compliant status in a year is 23 percent, this represents a 13 percent increase in the switching probability relative to the baseline.

To address the identification concern that differences in the benefits, enrollee characteristics, or other market characteristics may be correlated with both the risk of the firm and the probability of switching to ACA compliance, columns II through IV add different controls. Column II adds gender-by-age demographics for employees and enrollees, which may correlate with health risk. Column III adds cost-sharing characteristics of the plans. There might be correlation between the characteristics of the plan and the risk of its pool, in the sense that less generous plans could attract healthier people. Additionally, given that the set of benefits under the ACA compliance is more standard and with more generous coverage, it could be the case that less generous plans have more incentive to switch. Finally, Column IV adds market-by-year fixed effects to capture differences across markets at each period of time, including the market risk in the ACA compliant pool in each year. In all cases, the main results are very similar across specifications, ranging from 2.75 to 3.03 percentage points. This provides evidence that omitted variable bias does not explain our results. Additionally, Appendix Table A.4 compares plan benefits before and after the adoption of ACA compliance, showing that most benefits do not change substantially after adoption. The only two characteristics that are slightly different after the plans switch to ACA compliance status are the out-of-pocket maximums for the individual and the family, although these differences are not statistically significant.

Our second main analysis examines whether option value from employee turnover delays switching to ACA compliance. Column V of Table 3 replicates Column III but adds a regressor that indicates employee turnover in 2013, which is a proxy for the option value from remaining in legacy status. We find that this regressor is significantly negative, consistent with the option value story. From our estimates, a one standard deviation (0.37) increase in 2013 plan turnover decreases the probability of ACA adoption by 2.4 percentage points or 13 percent relative to the baseline. Thus, our data provide support for the proposition that employers remain in legacy status for the option value.

Overall, the results show that an adversely selected set of plans opt into ACA compliance, with advantageously selected plans remaining in legacy status. This evidence is consistent with

Table 3: Adoption of ACA-Compliant Status

	(I)	(II)	(III)	(IV)	(V)
	Dependent Variable: Adoption of ACA Compliance				
Plan Risk (from lagged data)	0.0293***	0.0303***	0.0281***	0.0275***	0.0280***
	(0.0012)	(0.0013)	(0.0013)	(0.0013)	(0.0013)
Plan Turnover in 2013					-0.0653***
					(0.0030)
Lagged Number of Enrollees	-0.0014***	-0.0014***	-0.0014***	-0.0011***	-0.0014***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lagged Average Age		0.0002	0.0006	0.0007	-0.0004
		(0.0005)	(0.0005)	(0.0005)	(0.0005)
Lagged Fraction Female		0.0159	0.0146	0.0125	0.0170
		(0.0155)	(0.0154)	(0.0150)	(0.0154)
Lagged Plan Cost-Sharing Characteristics	N	N	Y	Y	N
Lagged Enrollee Characteristics	N	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	N	Y
State Fixed Effects	Y	Y	Y	N	Y
State-by-Year Fixed Effects	N	N	N	Y	N
Observations	115,386	115,386	115,386	115,386	115,386

Note: Sample is the same as in Table 1 and plan cost-sharing characteristics are listed in Table 1. Enrollee characteristics include fraction of male and female for ages less than 18, 18 to 30, 31 to 45 and 46 to 64. Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1

prior work documenting adverse selection into health plans within an employer (Cutler and Reber, 1998; Handel, 2013), in the small group market (Simon, 2005), and in the individual market (Hackmann, Kolstad and Kowalski, 2015; Lo Sasso and Lurie, 2009).

On-Line Appendix A presents two sets of robustness results. First, Table A.2 present results with alternative assumptions as to the timing of adoption of ACA compliance. The results are similar to the base results in Table 3. Second, it presents results which limit our sample to employers that offer only one plan. These results, which are in Figure A.1 and Table A.5, are very similar to our baseline results in Figure 1 and Table 3, respectively.

4.3 Quantifying Adverse Selection

To quantify the magnitude of adverse selection, Table 4 describes the evolution of the average risk of different groups. Column I presents the average risk of legacy status plans. Column II presents the average risk of ACA-compliant plans that existed in 2013, and hence switched from legacy status to ACA compliance. Column III provides the average risk of ACA-compliant plans that are new after 2013. Column IV presents the average risk of all ACA-compliant plans. Column V calculates the impact on market risk if incumbent regulation were eliminated and all legacy

plans were pooled with ACA-compliant ones. Column VI presents the change in market risk that would be generated by this pooling (Column IV minus Column V).

Column I shows that the risk for plans in legacy status decreases over time, from 1.077 in 2014 to 1.016 in 2017. The decline in risk is monotonic except for 2016, where legacy plans have a risk of 0.919, which is even lower than the 2017 risk. Column II shows the risk of plans that switched to ACA compliance was higher than the risk of legacy status plans in each year. Column III shows that the market for new ACA-compliant plans is also evolving, with its risk decreasing from 1.221 in 2014 to 1.027 in 2017, implying more favorable selection over time. This change reflects a different mix of employers starting coverage with USIC in the small group market—which do not have access to legacy plans—rather than any effect of incumbent regulation.

From Column VI, if incumbent regulation was not permitted and all health plans were pooled into ACA compliance, the ACA-compliant market risk would have decreased by 0.112 in 2014, which is 11.2% of the population mean risk. However this difference declines over time due to the decrease in health risk for new ACA compliant plans (Column 3). By 2017, the difference in risk between legacy status plans and ACA-compliant plans was only 0.006.

To understand these values in terms of associated healthcare costs, Column VII multiplies the $Market\ Risk_{mt}$ change by the average yearly spending amount associated with a unit change in individual health risk, which is \$3,263 (from Table 2, Panel A, Column III). The implied cost change is \$365 annually per member in 2014. In 2015 the market risk effect falls to 0.076, with an implied incremental annual cost change of \$248. By 2017, the market risk differential between the community rated and experience rated pools was 0.006, implying an incremental annual cost change of \$20.

Column VIII further examines the impact of legacy status on premiums for ACA-compliant plans, using Table 2 Panel B Column III to evaluate the effect of risk changes on premiums. We estimate much smaller effects than for costs: \$78 per member annually in 2014 dropping to \$4 in 2017. The discrepancy between the implied spending and implied premiums is consistent with our work finding that health insurers only passed through a small fraction of spending changes from health shocks in the form of higher premiums (Fleitas, Gowrisankaran and Lo Sasso, 2018). Here, because of incumbent regulation, individuals in the ACA-compliant pool had higher costs of \$365 and paid \$78 more on average in 2014, implying an implicit pass-through of 22%.

Table 4: Adverse Selection Effects of Incumbent Regulation

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
	Market Health Risk of:					Changes from Eliminating Legacy Status Plans:		
	Legacy Status Plans	ACA Compliant, Switchers	New ACA Compliant Plans	All ACA Plans	Eliminate Legacy Status	Δ Market Risk	Δ Market Cost	Δ Market Premium
2014	1.077	1.250	1.221	1.242	1.130	-0.112	-$365	-$78
2015	1.044	1.182	1.173	1.174	1.098	-0.076	-$248	-$53
2016	0.919	1.105	0.974	0.976	0.950	-0.026	-$85	-$18
2017	1.016	1.178	1.027	1.032	1.026	-0.006	-$20	-$4

Note: Column I presents the average risk of legacy status plans. Column II presents the average risk of plans that were in the market in 2013 and switched to ACA compliance. Column III provides the average risk of ACA-compliant plans that are new after 2013. Column IV presents the average risk of ACA-compliant plans. Column V presents the counterfactual average risk of ACA-compliant plans if all the individuals in legacy plans were moved to ACA-compliant plans. Column VI presents the change in market risk between Column V and Column IV. Column VII presents the change in average costs per individual from Column V. This result comes from multiplying the market risk change by the spending effect associated with this change (from Table 2, Panel A, Column III). Column VIII presents the change in the average premium per individual from Column V. This result comes from multiplying market risk change by the premium effect associated with this change (from Table 2, Panel B, Column III).

Finally, we compare the size of these losses for individuals in ACA-compliant plans to the gains obtained by individuals in legacy status plans. In particular, we compute the premium differences for individuals in legacy status plans as the difference between their premiums in the ACA-compliant pool if legacy status was not allowed (using the Table 2 Panel B Column III estimates) minus how much they would paid in their own legacy status plan (using the Table 2 Panel C Column III estimates). We find that individuals in legacy status plans would have faced $320 more in average incremental annual premiums in 2014, dropping to $64 more in 2017. Therefore, on average, individuals in legacy plans would have experienced a substantial premium increase from eliminating legacy status, that is larger than the gains from individuals in plans with ACA-compliant status.

Overall, while legacy status created a significant adverse impact on the community-rated risk pool, the incremental effect wanes over time for two reasons. First, plans that initially avoided the ACA-compliant pool will have health shocks and switch to ACA compliance, shrinking the remaining stock of legacy plans. Second, insurers could not insure new entrant employers with legacy plans, implying that employers in the ACA-compliant pool will increasingly come to reflect both good and bad health risks over time. The combination of the two factors result in the incremental effect of eliminating legacy status diminishing over time.

Note that our quantification assumes that all employers would switch to ACA-compliant plans if legacy plans were banned. In reality, in this case some low-risk small employers might choose to

terminate health insurance coverage, while other, higher-risk small employers might start ACA-compliant coverage. It is difficult to evaluate the magnitudes of these margins, which ultimately depend on equilibrium demand elasticities and market risk. Nonetheless, our results show that it is likely that adverse selection substantially impeded the ACA-compliant market for small group insurance in 2014 and 2015, with smaller impacts after that.

5 Conclusion

The 2010 Affordable Care Act introduced consequential and substantial changes to health insurance markets. In an effort to smooth the transition and minimize disruptions to ex ante market conditions, legacy status provisions were introduced as part of the law and extended in its subsequent implementation. Our work represents the first systematic study of the effects of incumbent regulation in health insurance markets.

Our empirical results are consistent with a simple theoretical model that predicts that plans will be adversely selected into the ACA-compliant market. They indicate that plans with healthier enrollees were less likely to switch to ACA compliance. The magnitudes are important: an increase in the health risk score of 1 (corresponding to a doubling relative to the population mean health risk) implies a 3 percentage point lower probability of adopting ACA compliance in any year, and a one standard-deviation increase in expected plan turnover implies a 2.4 percentage point lower adoption probability.

From an insurance market perspective, the ability to segment a healthier subset of the market via incumbent regulation imposes a cost on the rest of the market. It is analogous to allowing legacy polluters to continue to operate while new entrants must switch to newer mitigation technologies. The cost here is highest initially but wanes over time as legacy plans switch to community rating after experiencing health shocks and new market entrants can only avail themselves of ACA-compliant plans, thus broadening the risk distribution of the pool. Within three years, the spillover cost of incumbent regulation is comparatively small. Nonetheless, our results show that incumbent regulation had a large impact on the ACA-compliant small group market in the first years after the implementation of the ACA.

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On-Line Appendices

A On-Line Appendix A: Robustness Tables

Table A.1: Effect of Risk on Premiums.
Robustness to Panel B of Table 2 with Different Adoption Timing Assumptions

	(I)	(II)	(III)
	Panel A: Alternative Assumption on Timing of ACA Compliance 1		
	Dependent Variable: Annual Premiums per Individual		
Market Risk	674***(31)	553***(30)	751***(59)
Plan Risk		134*** (4)	119*** (4)
Average Age	153*** (0.30)	161*** (1.22)	164*** (1.14)
Number of Enrollees	-3.07*** (0.18)	-4.97*** (0.18)	-3.20*** (0.16)
Plan Cost-Sharing Characteristics	Y	Y	Y
Enrollee Characteristics	N	Y	Y
State Fixed Effects	N	N	Y
Year Fixed Effects	Y	Y	Y
Observations	209,013	209,013	209,013
	Panel B: Alternative Assumption on Timing of ACA Compliance 2		
	Dependent Variable: Annual Premiums per Individual		
Market Risk	1,168***(72)	1,160***(72)	1,108***(71)
Plan Risk			107*** (8)
Average Age	153*** (0.55)	170*** (2.17)	166*** (2.18)
Number of Enrollees	-0.87** (0.32)	-3.16*** (0.33)	-2.99*** (0.33)
Plan Cost-Sharing Characteristics	Y	Y	Y
Enrollee Characteristics	N	Y	Y
State Fixed Effects	N	N	N
Year Fixed Effects	Y	Y	Y
Observations	64,288	64,288	64,288

Note: Sample for Panel A is all plans in ACA compliance from 2014-17, observed for two consecutive years (in order to compute a plan risk score), where we assume all adoption of ACA compliance occurred in 2014. Sample for Panel B is all plans in ACA compliance in 2017, observed in 2016 and 2017 (in order to compute a plan risk score). Plan cost-sharing characteristics are listed in Table 1. Enrollee characteristics include fraction of male and female for ages less than 18, 18 to 30, 31 to 45 and 46 to 64, average age, and the number of enrollees. Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1

Table A.2: Adoption of ACA Compliance Status
Robustness to Table 3 With Different Adoption Timing Assumptions

	(I)	(II)	(III)	(IV)	(V)
	Panel A: Alternative Assumption on Timing of ACA Compliance 1				
	Dependent Variable: Adoption of ACA Compliance				
Plan Risk (from lagged data)	0.0530***	0.0531***	0.0543***	0.0506***	0.0461***
	(0.0023)	(0.0024)	(0.0024)	(0.0024)	(0.0025)
Plan Turnover in 2013					-0.124***
					(0.006)
Number of Enrollees	-0.0027***	-0.0029***	-0.0028***	-0.0028***	-0.0028***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Average Age		-0.0007***	-0.0010	-0.0005	-0.0020*
		(0.0003)	(0.0010)	(0.0010)	(0.0010)
Fraction Female		0.1610***	0.0418	0.0422	0.0434
		(0.0095)	(0.0297)	(0.0296)	(0.0296)
Plan Cost=Sharing Characteristics	N	N	Y	Y	Y
Enrollee Characteristics	N	Y	Y	Y	Y
State Fixed Effects	Y	Y	Y	Y	Y
Observations	45,462	45,462	45,462	45,462	45,462
	Panel B: Alternative Assumption on Timing of ACA Compliance 2				
	Dependent Variable: Adoption of ACA Compliance				
Plan Risk (from lagged data)	0.0385***	0.0346***	0.0360***	0.0304***	0.0341***
	(0.0024)	(0.0027)	(0.0027)	(0.0026)	(0.0027)
Plan Turnover in 2013					-0.138***
					(0.004)
Number of Enrollees	-0.0033***	-0.0033***	-0.0032***	-0.0029***	-0.0030***
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0001)
Average Age		0.0002	0.0007	0.0014	-0.0007
		(0.0003)	(0.0010)	(0.0009)	(0.0010)
Fraction Female		0.1793***	0.0194	0.0110	0.0195
		(0.0093)	(0.0302)	(0.0292)	(0.0300)
Plan Cost=Sharing Characteristics	N	N	Y	Y	Y
Enrollee Characteristics	N	Y	Y	Y	Y
State Fixed Effects	Y	Y	Y	Y	Y
Observations	43,699	43,699	43,699	43,699	43,699
	Panel C: Alternative Assumption on Timing of ACA Compliance 3				
	Dependent Variable: Adoption of ACA Compliance				
Plan Risk (from lagged data)	0.0559***	0.0534***	0.0545***	0.0496***	0.0461***
	(0.0023)	(0.0025)	(0.0025)	(0.0025)	(0.0025)
Plan Turnover in 2013					-0.127***
					(0.006)
Number of Enrollees	-0.0028***	-0.0029***	-0.0029***	-0.0028***	-0.0028***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Average Age		-0.0001	0.0001	0.0006	-0.0010
		(0.0003)	(0.0010)	(0.0010)	(0.0010)
Fraction Female		0.1654***	0.0526*	0.0512*	0.0537*
		(0.0096)	(0.0300)	(0.0299)	(0.0299)
Plan Cost=Sharing Characteristics	N	N	Y	Y	Y
Enrollee Characteristics	N	Y	Y	Y	Y
State Fixed Effects	Y	Y	Y	Y	Y
Observations	43,360	43,360	43,360	43,360	43,360

Note: Panel A assumes that all adoption of ACA compliance occurred in 2014 and derives plan and enrollee characteristics from 2013 data. Panel B assumes that all adoption of ACA compliance occurred in 2017 and derives plan and enrollee characteristics from 2016 data. Panel C assumes that all adoption of ACA compliance occurred in 2017 and derives plan and enrollee characteristics from 2013 data. Sample for Panel A is all plans in 2014 that were observed in 2013 and 2014. Sample for Panels B and C is all plans in 2017 that were observed continuously from 2013-17. Plan cost-sharing characteristics are listed in Table 1. Enrollee characteristics include fraction of male and female for ages less than 18, 18 to 30, 31 to 45 and 46 to 64. Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1

Table A.3: Adverse Selection Effects of Incumbent Regulation
Robustness to Table 4 With Single Plan Employers Only

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
	Market Health Risk of:					Changes from Eliminating Legacy Status Plans:		
	Legacy Status Plans	ACA Compliant, Switchers	New ACA Compliant Plans	All ACA Plans	Eliminate Legacy Status	Δ Market Risk	Δ Market Cost	Δ Market Premium
	Alternative Assumption on Timing of ACA Compliance 1							
2014	1.058	1.231	1.206	1.225	1.130	-0.095	-$310	-$85
2015	1.008	1.183	1.175	1.176	1.106	-0.070	-$228	-$63
2016	0.904	1.186	0.975	0.985	0.950	-0.035	-$114	-$31
2017	1.016	1.178	1.027	1.032	1.026	-0.006	-$20	-$5
	Alternative Assumption on Timing of ACA Compliance 2							
2017	1.016	1.137	0.970	1.032	1.026	-0.006	-$20	-$7

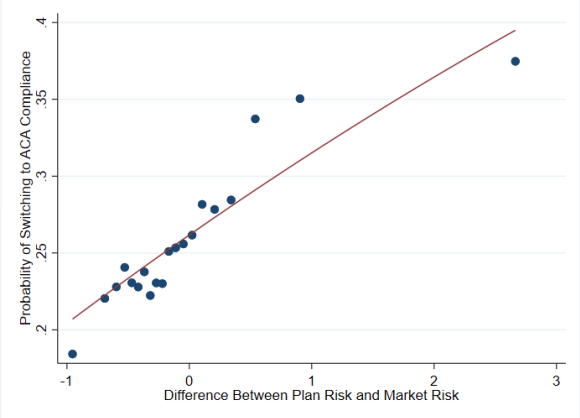
Note: Column I presents the average risk of legacy status plans. Column II presents the average risk of plans that were in the market in 2013 and switched to ACA compliance. Column III provides the average risk of ACA-compliant plans that are new after 2013. Column IV presents the average risk of ACA-compliant plans. Column V presents the counterfactual average risk of ACA-compliant plans if all the individuals in legacy plans were moved to ACA-compliant plans. Column VI presents the change in market risk between Column V and Column IV. Column VII presents the change in average costs per individual from Column V. This result comes from multiplying the $Market\ Risk_{mt}$ change by the spending effect associated with a one-unit change in r_i (from Table 2, Panel A, Column III). Column VIII presents the change in the per enrollee monthly health insurance premium (from Table A.1, Column III, of the correspondent alternative assumption about timing of ACA compliance) if all legacy plans were moved to ACA compliance.

Table A.4: Plan Cost-Sharing Characteristics

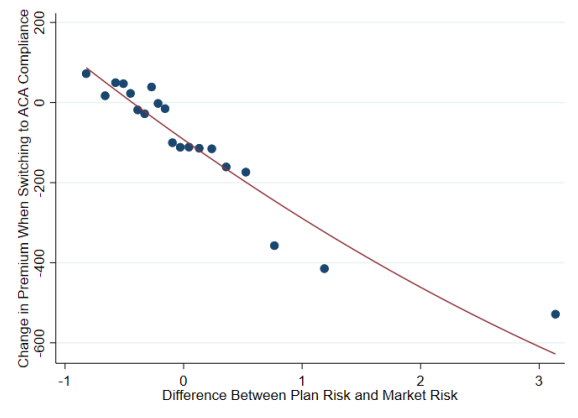
		Last Year as Legacy Plan		Year of ACA Compliance Adoption	
Variable:	Obs	Mean	Std. Dev.	Mean	Std. Dev.
Hospital Coinsurance	26,264	0.88	0.12	0.87	0.12
Individual In-Network Deductible	26,264	1807	1338	1843	1338
Family In-Network Deductible	26,264	4600	3350	4404	3257
Emergency Room Copay	26,264	172	90	188	108
Office Coinsurance	26,264	0.99	0.05	0.98	0.06
Doctor Copay	26,264	23	11	24	11
Individual In-Net OOP Maximum	26,264	3510	1986	4034	1920
Family In-Network OOP Maximum	26,264	7798	4358	8586	4020
No Out-of-Network Coverage	26,264	0.07	0.26	0.08	0.27

Note: This table presents before and after plan characteristics for plans that switch from legacy status to ACA-compliant status from our Table 1 sample.

Figure A.1: ACA Compliance and Premiums Against Risk
Robustness to Figure 1 With Single Plan Employers Only



(a) ACA Compliance Versus
Plan Risk − Market Risk



(b) Δ Premiums Versus
Plan Risk − Market Risk

Note: Each subfigure groups the x variable—which is the difference between plan risk and market risk—into 20 bins and then plots this variable against the expectation of the variable listed on the y-axis conditional on each bin, along with a quadratic fit line. Figure A.1a uses the Table 1 sample, limited to employers that offer only one plan during the sample period. Figure A.1b uses the subset of this sample for plan/years with a switch from legacy status to ACA compliance during the year, limited to employers that offer only one plan during the sample period.

Table A.5: Adoption of ACA-Compliant Status
Robustness to Table 3 With Single Plan Employers Only

	(I)	(II)	(III)	(IV)	(V)
	Dependent Variable: Adoption of ACA Compliance				
Plan Risk (from lagged data)	0.0327***	0.0346***	0.0331***	0.0341***	0.0331***
	(0.0016)	(0.0017)	(0.0017)	(0.0017)	(0.0017)
Plan Turnover in 2013					-0.048***
					(0.004)
Lagged Number of Enrollees	-0.0018***	-0.0019***	-0.0018***	-0.0016***	-0.0018***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lagged Average Age		0.0001	0.0008	0.0000	-0.0003
		(0.0007)	(0.0007)	(0.0001)	(0.0007)
Lagged Fraction Female		0.0221	0.0216	0.0201	0.0236
		(0.0200)	(0.0200)	(0.0195)	(0.0200)
Lagged Plan Cost-Sharing Characteristics	N	N	Y	N	N
Lagged Enrollee Characteristics	N	Y	Y	Y	Y
State Fixed Effects	Y	Y	Y	N	Y
Year Fixed Effects	Y	Y	Y	N	Y
Year-by-Market Fixed Effects	N	N	N	Y	N
Observations	75,214	75,214	75,214	75,214	75,214

Note: Sample is the same as in Table 1, limited to employers that offer only one plan during the sample period, and plan cost-sharing characteristics are listed in Table 1. Enrollee characteristics include fraction of male and female for ages less than 18, 18 to 30, 31 to 45 and 46 to 64. Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1